

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Digital Audio Broadcasting Systems)	
And Their Impact On the Terrestrial Radio)	MM Docket No. 99-325
Broadcast Service)	

Comments of iBiquity Digital Corporation

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EXECUTIVE SUMMARY

iBiquity Digital Corporation (“iBiquity”) submits its comments in response to the Commission’s Public Notice on developments concerning In-Band On-Channel Digital Audio Broadcasting (“IBOC DAB”) technology. Specifically, the Commission has sought public comment on iBiquity’s recent report detailing the results of tests conducted on the FM IBOC system and the National Radio Systems Committee’s (“NRSC”) subsequent evaluation of those tests and endorsement of the iBiquity FM IBOC system. iBiquity believes that with this new information and the substantial support of the broadcast and consumer electronics industries for IBOC technology, the record is now ripe for the Commission to promptly endorse IBOC and the iBiquity system.

The iBiquity tests demonstrate and the NRSC has confirmed that the FM IBOC system is able to satisfy all the Commission’s criteria for evaluating DAB systems. In particular, the IBOC system will offer CD-quality audio and much greater robustness than FM analog. IBOC’s resistance to multipath inference in particular will greatly enhance listener enjoyment of radio. In addition, iBiquity’s tests demonstrate the IBOC system offers excellent digital coverage replicating analog coverage areas. Moreover, the test program demonstrated that IBOC can be implemented without causing harm to existing analog operations. The NRSC’s evaluation of the iBiquity tests resulted in a strong and comprehensive endorsement of IBOC as the best means of moving terrestrial radio into a digital world. iBiquity fully supports the NRSC’s recommendation that the Commission move forward to adopt IBOC.

iBiquity's comments request that the Commission take several steps with regard to its consideration of IBOC. iBiquity recommends that the Commission bifurcate its analysis of

IBOC. The Commission should use the first stage of this proceeding to develop a Report and Order validating and endorsing IBOC and the iBiquity system. In a second stage, the FCC should develop final IBOC rules on interference and the digital transition, as well as a final IBOC standard. In the initial Report and Order, iBiquity requests that the Commission announce that it is no longer considering out-of-band solutions for DAB. The Commission should use the iBiquity report, the NRSC endorsement and the strong industry consensus on IBOC to announce that IBOC is the best means of implementing DAB in the United States. Finally, the Commission should endorse the iBiquity IBOC system. iBiquity asks that the Commission take these initial steps immediately in order to support the upcoming commercial rollout of IBOC technology.

iBiquity also recommends that the Commission initiate a Further Notice of Proposed Rulemaking to develop final IBOC rules and an IBOC standard. These rules and the standard can be developed during the course of this year to ensure that work on IBOC is completed in time for commercial launch of IBOC receivers in the first quarter of 2003.

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iBiquity Digital Corporation (“iBiquity”) hereby submits these comments in response to the Commission’s recent Public Notice in the above-captioned proceeding.¹ The Commission’s Public Notice seeks comment on a report from the National Radio Systems Committee (“NRSC”)² endorsing iBiquity’s FM In-Band On-Channel (“IBOC”) Digital Audio Broadcasting (“DAB”) system as well as iBiquity’s report on its comprehensive laboratory and field tests conducted in 2001.³ Both iBiquity’s FM test results and the NRSC endorsement of iBiquity’s system demonstrate IBOC DAB will be a significant improvement over analog FM and can be introduced without causing harmful interference to existing analog FM station operations. As is discussed in greater detail herein, iBiquity encourages the Commission to promptly endorse IBOC and the iBiquity system as the best means for introducing DAB in the United States and to facilitate the commercial introduction of this technology later this year.

¹ Public Notice, DA 01-2932, MM Docket No. 99-325 (Dec. 19, 2001).

² *Evaluation of the iBiquity Digital Corporation (iBiquity) IBOC System, Part I-FM IBOC* dated Dec. 3, 2001 (hereinafter referred to as “NRSC Evaluation”). The NRSC is an industry group jointly sponsored by the National Association of Broadcasters (“NAB”) and the Consumer Electronics Association.

³ iBiquity submitted a report on its FM testing to the Commission on December 6, 2001. Those test results are referred to herein as the “iBiquity Test Report”.

I. Introduction

A. Background on iBiquity

iBiquity was formed in August 2000 through the merger of Lucent Digital Radio, Inc. (“LDR”) and USA Digital Radio, Inc. (“USADR”). Both LDR and USADR had developed IBOC DAB solutions, which were the subject of tests conducted and submitted to the NRSC in late 1999 and early 2000.⁴ Since August 2000, iBiquity has integrated the former LDR and USADR technology, creating a unified IBOC DAB platform that is ready for commercial implementation. As of February 1, 2002, iBiquity holds or has rights to 47 patents as well as numerous pending patent applications relating to DAB and is the only entity proposing a DAB solution for the United States.

In order to promote a consensus on IBOC DAB, iBiquity has established relationships with all industries involved in radio broadcasting. iBiquity’s shareholders include the top 9 and 14 of the top 25 of the nation’s radio broadcasters, the second largest domestic manufacturer of radio receivers, the largest U.S. manufacturer of radio transmission equipment, one of the nation’s largest semiconductor manufacturers and a U.S. automobile manufacturer (who is a significant retailer of radio receivers). In addition, iBiquity has technology development or marketing relationships with all major receiver manufacturers, numerous manufacturers of receiver components and consumer electronics retailers.⁵ Through these relationships iBiquity has built both an industry consensus supporting IBOC and the infrastructure required for

⁴ A third IBOC “proponent,” Digital Radio Express, Inc. (“DRE”), announced in December 1999 that it would discontinue its system development efforts and endorsed USADR’s IBOC system. iBiquity now holds all rights to use DRE’s patented technology for IBOC DAB.

⁵ See Exhibit A for a list of iBiquity shareholders and strategic partners working toward the implementation of IBOC.

successful commercial implementation of IBOC. The NRSC's endorsement of IBOC serves as the most recent example of industry consensus on IBOC and the benefits of this technology.

Commercial IBOC transmission equipment will be available in April 2002. iBiquity plans by the end of 2002 to have multiple stations broadcasting digitally in each of six roll out markets.⁶ iBiquity's goal is to have digital broadcasts for a significant portion of each market's share of listeners to promote receiver sales in those locations. iBiquity also plans to have some presence in five secondary markets by year-end.⁷ Commercial receivers will be introduced at the Consumer Electronics Show in January 2003 ("CES'03") and will be available for retail sale in spring of that year.

B. Regulatory Background

This proceeding commenced in 1998 when USADR filed a Petition for Rulemaking on IBOC DAB.⁸ The Commission issued a Notice of Proposed Rulemaking on terrestrial DAB on November 1, 1999.⁹ At that time, the Commission confronted several issues. The Commission was concerned with the threshold question of the viability of IBOC DAB technology. The Commission also needed to examine the extent of industry support for IBOC and to choose among competing IBOC solutions.

Since the 1999 NPRM, iBiquity has addressed all these issues. iBiquity is the sole developer of IBOC DAB and the only entity proposing a means to provide a digital upgrade for

⁶ The six primary rollout markets are New York City, Los Angeles, San Francisco, Chicago, Seattle, and Miami.

⁷ The secondary rollout markets are Detroit, Dallas, Denver, Boston, and Atlanta.

⁸ Petition for Rulemaking of USA Digital Radio Partners, L.P., dated October 7, 1998. This Petition was placed on Public Notice on November 6, 1998 (RM-9395).

⁹ *Digital Audio Broadcasting Systems and Their Impact on the Terrestrial Radio Broadcast Service*, 15 FCC Rcd 1722 (1999) ("NPRM").

AM and FM radio. During 2001, iBiquity conducted almost twelve months of laboratory and field testing of its AM and FM systems. Those tests, conducted pursuant to test procedures developed by the NRSC and using three separate independent laboratories, involved thousands of tests, audio samples and evaluations. Field tests involved ten commercial FM and AM stations serving listeners in eight states and the District of Columbia.

The Commission noted in the NPRM that the NRSC could provide the best guidance on the introduction of DAB. It further stated it would “give great weight to any industry compromise the NRSC may achieve.”¹⁰ The NRSC has now spoken very forcefully in support of iBiquity’s IBOC system. The iBiquity Test Report and the NRSC Evaluation establish the viability of IBOC. The endorsement from the NRSC provides input from both the broadcasting and consumer electronics industries. iBiquity’s coalition of supporters supplements this evidence of a strong industry consensus on the need for the prompt introduction of IBOC. Moreover, unlike the situation the Commission confronted in 1999, there are no longer conflicting proposals for an IBOC system. Thus, all the issues raised in the NPRM have now been resolved. Today, the Commission’s task is clear. It should provide a strong endorsement of IBOC and the iBiquity system in order to promote a prompt commercial implementation of the technology. At the same time, it should move forward to adopt final IBOC transition rules and an IBOC standard.

II. Broadcasters and Manufacturers Support IBOC

The NRSC Evaluation provides a comprehensive endorsement of IBOC from the broadcast and consumer electronics industries. The NRSC’s ultimate conclusion on IBOC provides clear guidance to the Commission:

¹⁰ See NPRM at ¶58.

The NRSC therefore recommends that the iBiquity FM IBOC system as tested by the NRSC should be authorized by the FCC as an enhancement to FM broadcasting in the U.S., charting the course for an efficient transition to digital broadcasting with minimal impact on existing analog FM reception and no new spectrum requirements.¹¹

This overall conclusion was based on the NRSC's finding that "the performance of the iBiquity FM IBOC system as tested represents a significant improvement over today's existing analog services."¹² The NRSC also concluded this significant improvement in performance could be achieved with relatively minor trade-offs. In particular, the NRSC found any potential impact to existing analog operations from the introduction of IBOC would be minimal and that existing analog interference and receiver design would mask any impact from IBOC. Therefore, the NRSC, as representative of the broadcast and consumer electronics industries, was able to provide a clear, comprehensive and strong endorsement of IBOC.¹³

III. The iBiquity System Satisfies the FCC's DAB Evaluation Criteria

In the NPRM the Commission identified tentative selection criteria for a DAB system.¹⁴ The Comments in response to the NPRM fully supported these criteria. As discussed below, the iBiquity Test Report and the NRSC Evaluation, demonstrate that the FM IBOC system satisfies each of the FCC's DAB selection criteria.

A. Enhanced Audio Fidelity

The iBiquity Test Report confirmed FM IBOC provides enhanced audio quality that significantly improves the listening experience. The iBiquity tests included extensive subjective

¹¹ NRSC Report at 9.

¹² *Id.*

¹³ *Id.*

¹⁴ *See* NPRM at ¶¶ 20-35.

evaluations, conducted at an independent laboratory, of audio samples of IBOC and analog FM under numerous interference and impairment conditions. For each audio genre tested, general population listeners consistently scored IBOC audio superior to analog FM. The iBiquity tests involved Classical, Country, Rock, Speech and Voiceover samples with first adjacent, second adjacent and dual adjacent interference, noise, multipath fading, and channel impairments. In experiments conducted using 120 listeners evaluating over 600 sound samples, IBOC consistently outscored analog.¹⁵

The NRSC testing was conducted using iBiquity's Generation 1 equipment. Generation 2 equipment incorporates iBiquity's own audio compression technology that was not compatible with Generation 1 hardware. As a result, tests on the audio quality of the IBOC system without impairments were not conducted until after completion of the NRSC evaluation. Exhibit B contains the results of iBiquity's subsequent test of IBOC audio quality in an unimpaired condition.¹⁶ This test provided further confirmation to the FCC and the broadcast industry that IBOC will offer upgraded audio quality. The test results demonstrated that IBOC will exceed the audio quality of the best possible analog and will deliver CD-quality sound. The unimpaired audio quality test followed the NRSC's test procedures and used eighteen separate audio samples the NRSC had identified as being "critical" of both IBOC and analog FM. The audio samples were selected to represent all major genres found in FM broadcasting. In all genres, iBiquity's IBOC system outscored each of the analog receivers and tracked the performance of the CD source. These tests demonstrate the superior audio quality of the IBOC system and its ability to deliver CD-quality sound.

¹⁵ See iBiquity Test Report at 8; NRSC Evaluation at 27-28.

¹⁶ These test results for audio quality in an unimpaired environment have been submitted simultaneously to the NRSC.

This unimpaired audio quality test compared IBOC against analog FM in the absence of impairments or interference, a situation rarely found in the real world.¹⁷ In most real world cases, analog FM audio would be degraded to some extent. In many cases, it would be significantly degraded.¹⁸ Digital quality, however, remains unchanged, even with impairments or interference, wherever digital is received. In the unimpaired test IBOC consistently outscored analog; but CD, IBOC and analog scores remained in a fairly close range. As impairments and interference from the real world are introduced, however, IBOC quality remains closely aligned with the CD. As the NRSC tests demonstrated, these impairments cause analog quality to degrade significantly, greatly increasing the differential in audio quality between IBOC and analog.

The iBiquity Test Report and the more recent unimpaired audio quality test provide conclusive evidence that IBOC satisfies the audio fidelity criteria.

B. Robustness

The iBiquity Test Report confirmed that IBOC's increased robustness in the face of impairments and interference will be among its most important benefits. The NRSC test program was designed to allow for direct comparisons of IBOC and analog under a variety of conditions, including co- and adjacent channel interference and channel impairments. In the vast majority of cases, IBOC's robustness greatly exceeded that of analog. The NRSC Evaluation confirms this is a great benefit that will be derived from IBOC.¹⁹

¹⁷ As discussed below, today's FM transmissions face a number of possible impairments, including multipath interference.

¹⁸ In the real world, analog broadcasters rely heavily on audio processing to overcome the effects of the analog channel. This audio processing creates additional degradation to FM analog beyond that evident in these tests, which used only light processing.

¹⁹ See NRSC Evaluation at 28-43.

The tests also demonstrated that IBOC's resistance to multipath interference will have a significantly beneficial impact on listeners. Multipath fading presents a great challenge for analog FM and frequently limits a station's ability to reach listeners, even in relative proximity to the transmission site. The IBOC system, in contrast, offers a high degree of robustness in the presence of multipath. This led the NRSC to conclude, "[o]f all the benefits provided listeners by IBOC technology, improved performance in the presence of multipath interference is likely to be the most profound."²⁰ IBOC robustness in the face of multipath will have a significant impact on broadcasting. Broadcasters transmitting with IBOC will be able to reach listeners within their core coverage area that are presently unable to receive acceptable levels of analog performance due to multipath. This has the potential to translate directly into higher listenership and higher revenue. Most importantly, it will provide listeners with greater choice of radio services within a particular coverage area.

C. Compatibility

The NRSC Evaluation concluded IBOC can be implemented without harmful interference to existing analog FM services. The NRSC Evaluation confirmed the introduction of IBOC would not impact listeners to the host analog signal or analog stations co-channel or second adjacent to the IBOC station.²¹ Because the IBOC system places the digital carriers on the side of the analog signal, the NRSC focused its analysis on listeners of analog stations first adjacent to the IBOC station. The NRSC found that in the vast majority of cases, there was almost no potential for IBOC to impact listeners within a first adjacent analog station's protected contour. Outside the protected contour, there could be some potential for impact from the IBOC

²⁰ *Id.* at 35.

²¹ *Id.* at 9.

signal to the analog station in areas closer to the IBOC station transmitter. However, the NRSC concluded any such impact would be limited for several reasons. First, areas of potential interference are small and any listener would have to be located in specific geographic locations outside a station's protected contour to have any impact. Second, only particular types of receivers have the potential to receive interference. Therefore, the NRSC found that in order to experience interference, there would need to be a listener with certain receivers located in certain limited locations listening to a station outside of its protected contour. Based on this limitation, the NRSC concluded any potential impact from first adjacent interference was more than outweighed by the benefits of IBOC.²²

The NRSC also found that there would be *de minimis* impact on analog reception caused by second adjacent channel hybrid FM stations.²³ With these findings, the compatibility of IBOC DAB with the existing analog network has been firmly established.

D. Spectrum Efficiency

As the Commission's NPRM noted, IBOC is inherently efficient because it permits the introduction of digital broadcasting without the need for additional spectrum.²⁴ IBOC has the added benefit of permitting the introduction of completely new services without the need for more spectrum. The iBiquity Test Report discussed the new datacasting services that will be possible after the introduction of IBOC.²⁵ These datacasting services have the potential to transform the way consumers use radio receivers and to provide a low-cost means of delivering a

²² *Id.* at 9, 53-59.

²³ Although one of the receivers used in the NRSC tests indicated a potential for impact from second adjacent IBOC operations, the NRSC concluded that this receiver was not typical of second adjacent channel sensitivity and that it represented a worst case scenario. *Id.* at 60.

²⁴ *See* NPRM at ¶ 26.

²⁵ *See* iBiquity Test Report at 35-36.

range of new services to the public. For example, IBOC's datacasting capabilities may enable broadcasters and consumer electronics manufacturers to cost effectively provide consumers with devices capable of delivering audio, text messages, stock quotes, news and other information. This "remining" of the already heavily used broadcast spectrum to provide even more services offers the Commission an opportunity to achieve an unusually high level of spectrum efficiency.

E. Flexibility/Auxiliary Capacity

The iBiquity Test Report detailed the tremendous flexibility that has been incorporated into the IBOC system design. This flexibility is intended to give broadcasters maximum latitude to tailor their service offerings and to use auxiliary capacity to meet the needs of the listening public.²⁶

Among the many options that will be available to broadcasters, there are two options that highlight the flexibility incorporated in the iBiquity system design. In both cases, this flexibility has been designed to allow broadcasters to provide the right mix of services to meet consumers needs. In the first case, the audio compression technology has been designed to allow broadcasters to trade off bits between audio and data. By decreasing the number of bits devoted to audio, the broadcaster will be able to increase datacasting capacity. For some formats, such as Country or Rock, where the density of the music decreases the perception of fine audio quality differences, or talk, where audio fidelity is not as apparent, this tradeoff may be imperceptible to listeners.

As a second option, broadcasters will be able to add digital carriers closer to the analog host signal to gain additional datacasting capacity. This "extended hybrid mode" may be attractive with formats that can tolerate some small level of crosstalk from the digital to the

²⁶

Id. at Appendix A.

analog signal. In both cases, however, these modes will be available for those broadcasters that find these options compatible with their needs and the needs of their listeners.²⁷

iBiquity notes the Commission's discussion of auxiliary capacity in the NPRM drawing an analogy with the Commission's rules concerning DTV. Specifically, the NPRM referred to the requirement that DTV licensees pay fees to provide ancillary services in certain circumstances.²⁸ iBiquity encourages the Commission to reject consideration of fees associated with datacasting services. In the case of television, those fees were assessed as a direct result of the allocation of new spectrum for DTV.²⁹ Because IBOC will not involve the allocation of additional spectrum, the analysis used to assess fees on DTV licensees is not applicable for auxiliary IBOC datacasting services.

F. Extensibility

The IBOC system has been designed for both forward and backward compatibility. The system offers backward compatibility by providing for continued analog broadcasting in the hybrid mode. The system also is forward compatible because it has been designed to support additional modes and services without rendering early IBOC receivers obsolete. For example, first generation IBOC receivers will be able to support multiple modes of all-digital service even though broadcasters will not broadcast in those modes until sometime in the future.

²⁷ As is explained in greater detail below, iBiquity believes the Commission does not need to analyze all the available modes in order to endorse IBOC. iBiquity encourages the Commission to address these implementation issues at a later date.

²⁸ See NPRM at ¶ 30.

²⁹ See *Report and Order* in MM Docket No. 97-247, *In the Matter of Fees for Ancillary or Supplemental Use of Digital Television Spectrum Pursuant to Section 336 (e)(1) of the Telecommunications Act of 1996*, 14 FCC Rcd 3259 (1998); *Memorandum Opinion and Order on Reconsideration*, in MM Docket No. 97-247, FCC 99-362, released November 24, 1999.

G. Accommodation of Existing Broadcasters

IBOC has been designed specifically to ensure that all broadcasters will have the opportunity to upgrade to digital. This can be accomplished using existing broadcast facilities and frequency assignments. Although the NRSC Evaluation only addressed the FM IBOC system, IBOC will offer a digital future to both AM and FM broadcasters. The NRSC currently is evaluating the results of iBiquity's AM test program, and iBiquity expects a similar endorsement for AM as was forthcoming for FM.

H. Coverage

The IBOC system was designed to replicate existing broadcast coverage. The iBiquity Test Report confirms that the FM IBOC system achieves this goal. iBiquity's tests included field tests on seven commercial FM stations representing most conditions typically experienced in the FM band. The test stations included all classes of licensed stations and involved stations with significant levels of adjacent channel interference and severe multipath conditions. In addition, the test stations included a variety of antenna and transmission configurations. The tests demonstrated that the hybrid mode operation provided reliable digital coverage to the 45-50 dBu signal level. In several cases, digital coverage extended well beyond this point. In addition, in the core coverage area, the IBOC system provided more reliable coverage than analog due to the IBOC system's enhanced robustness in the presence of multipath. For example, in urban areas such as Manhattan, where analog FM reception is severely impacted by multipath, the IBOC system provided uniform digital coverage. All this was achieved with the digital signal transmitting at 1% of analog power.

The IBOC systems' blend-to-analog feature ensures that IBOC coverage will never be less than existing analog coverage. At the edge of digital coverage, the IBOC system smoothly

transitions to analog to ensure that listeners will continue to receive a signal until the end of analog coverage.³⁰

Although the iBiquity Test Report and the NRSC Evaluation focused on hybrid mode operations, iBiquity also conducted tests of the FM all-digital mode during 2001. These all-digital tests were designed to confirm the all-digital system is viable and will extend coverage beyond that of hybrid mode operations. By extending the digital coverage, the all-digital system ensures that IBOC replicates the full extent of analog coverage.³¹ iBiquity's all-digital tests were conducted using WETA in Washington, D.C. and WWIN in Baltimore, Maryland. The all-digital tests confirmed the extended coverage of the digital system. For example, operating on WETA in the all-digital mode, IBOC is able to provide consistent coverage to the 30 dBu signal level. This is considerably greater coverage than the 45-50 dBu signal level achieved by the hybrid system. In many cases, the all-digital system provided coverage extending well beyond the 30 dBu signal level. This level of coverage will extend digital coverage throughout the area currently served by analog broadcasts.

I. Implementation Costs

Although the iBiquity Test Report and the NRSC Evaluation did not address the issue of cost, the iBiquity system was designed to minimize implementation costs. iBiquity has conducted numerous field tests to confirm the functionality of its system with a variety of transmission configurations and equipment. iBiquity's tests have established that IBOC can be implemented while retaining much of the existing transmission equipment and infrastructure used for analog broadcasts. Based on this fact, iBiquity estimates the cost to upgrade to digital

³⁰ See NRSC Report at 31; iBiquity Report at 9-10.

³¹ The results of iBiquity's all-digital tests are contained in Exhibit C.

will be between \$30,000 and \$200,000, with an average of \$75,000, depending on the particular station involved. Moreover, IBOC's ability to support an extended transition period will allow broadcasters to upgrade their equipment in the normal course of equipment replacement cycles. In addition, iBiquity expects that IBOC receivers will be initially available at a small premium over existing receivers but it is anticipated that prices will come down as the volume of receivers sold increases.

IV. The Commission Should Endorse iBiquity's System

iBiquity encourages the Commission to act quickly to facilitate and encourage the commercial introduction of IBOC technology. To accomplish this, iBiquity suggests that the Commission pursue a two-step process in order to conclude its consideration of IBOC. The Commission should bifurcate its analysis by addressing in a First Report and Order on DAB the validation of IBOC as the best means to implement DAB in the United States. This can be accomplished immediately. The Commission should then focus on the second stage of its analysis: establishing a regulatory regime that supports the introduction of IBOC, including transition rules and an IBOC standard.

It has been more than two years since the Commission issued the NPRM. During that time, there has been tremendous technical and business progress in the development of IBOC. Today, the technology is poised for commercial introduction. Continued Commission silence on the path it will pursue for implementation of DAB, however, will chill the commercial introduction of this innovative and unique technology. In order to promote the timely and successful introduction of IBOC, the Commission should adopt an order addressing several threshold issues and indicating the Commission's intention to move forward with IBOC.

The NPRM left open the possibility of out-of-band solutions for implementing DAB.³² Developments in the broadcast industry and the evolution of IBOC technology since 1999 have eliminated any justification for further consideration of non-IBOC solutions. The iBiquity Test Report and the NRSC Evaluation conclusively demonstrated the benefits and viability of IBOC. There should be no further questions about the viability of IBOC technology, its usefulness or the ability to implement IBOC in the field. At the same time, the Commission should recognize the significant business developments that have taken place since 1999. When the NRPM was issued, key industry players continued to express support for IBOC without firm commitments to the technology. Since then, every segment of the broadcast and consumer electronics industries necessary for a successful launch of IBOC has committed its support. Transmitter manufacturers are only a few months away from launch of IBOC transmitters. iBiquity's strategic partners in the semiconductor and receiver manufacturer industries are making a significant investment in development of IBOC products for launch in 2003. Also, a number of the nation's largest radio broadcasters are planning for and have committed to support launch of IBOC in 2002. The Commission can rely on this information as the basis for making a final determination that an in-band solution is the best means to implement DAB in the United States. The Commission should officially state that it is no longer pursuing an out-of-band solution. At the same time, the record in this proceeding now enables the Commission to endorse the iBiquity system as the IBOC system for the United States.

The Commission's endorsement of IBOC should not be limited to hybrid operations, but should include the all-digital mode. The hybrid mode is designed as a transitional phase between analog and all-digital. It is imperative that all IBOC receivers include the all-digital mode so that

³² See NPRM at ¶¶ 40-49.

even first generation IBOC receivers remain functional after commencement of all-digital broadcasts. An explicit endorsement of all-digital operations for the future will encourage manufacturers to include this in all IBOC receivers. iBiquity does not believe that it is necessary to address the transition to all-digital before the Commission endorses the all-digital system. iBiquity encourages the Commission to consider in the second phase of its IBOC analysis the specific transition rules and the power levels of the all-digital mode of operation.

It is imperative that the Commission takes action on a First Report and Order during the summer of 2001. iBiquity is poised to have dozens of stations broadcasting digitally prior to the rollout of receivers in January 2003. Moreover, receiver manufacturers planning to introduce their products at CES'03 need to make production commitments in the fall of 2002. These industries are spending large sums of money to advance IBOC and bring products to market as soon as possible. Any failure on the part of the Commission to indicate to the industry this threshold level of support for IBOC will significantly impede the success of any IBOC rollout.

The Commission also should take note of its repeated commitment to ensure a digital future for terrestrial radio broadcasters.³³ The successful launch of satellite DARS last fall and the introduction of service from a second provider this year offer an additional incentive for the Commission to expedite its consideration of IBOC. The Commission should move quickly to ensure that terrestrial broadcasters are able to maintain their competitive position against these new satellite-based radio services.

As is discussed in greater detail below, iBiquity suggests that the Commission include in a Further Notice of Proposed Rulemaking specific proposals for final IBOC rules and a proposal for adoption of an IBOC standard. Commencement of the second phase of the Commission's

³³ See e.g. NPRM at ¶¶ 4-6.

consideration of IBOC this summer will allow the Commission to complete its consideration of IBOC prior to the commercial sale of receivers after CES'03.

V. Issues for Consideration in a Further Rulemaking

In addition to the endorsement of the iBiquity IBOC system in a First Report and Order discussed above, the Commission will also need to issue a Further Notice of Proposed Rulemaking to complete the implementation of IBOC. This Further Notice should propose specific rule changes that will facilitate the prompt introduction of IBOC throughout the United States. At the same time, the Further Notice should propose a regulatory framework that will ensure that digital broadcasters can operate with confidence that the technical integrity of all radio broadcast stations will be maintained during the transition from analog to digital. Specifically, the Commission will need to adopt an IBOC standard and make decisions about what should be included in that standard and who should maintain the standard. This regulatory framework also will need to include rules that provide listeners with confidence that the technical integrity of existing analog radio will be maintained during the transition to digital and that the newly introduced digital broadcasts also enjoy appropriate protection. Additionally, the Commission will need to establish rules that will enable all broadcasters to promptly introduce IBOC without the need for prior approval from the FCC. Finally, the Commission will need to establish rules or policies regarding the transition from analog to digital. Each of these issues presents important public policy questions that should be addressed by the Commission in a Further Notice.

Terrestrial DAB has been in development for approximately 12 years. During that time most radio transmission services (e.g., television, mobile telephony, industrial radio, etc.) have established the appropriate regulatory mechanisms and have begun the transition to digital.

Today, IBOC technology has matured and is now ready for commercial introduction in the United States and throughout the world. iBiquity urges the Commission to expeditiously issue a First Report and Order and Further Notice of Proposed Rulemaking that will allow listeners to promptly reap the tremendous benefits offered by IBOC.

VI. Conclusion

Based on the foregoing, iBiquity Digital Corporation respectfully requests that the Commission accept these comments and promptly adopt an endorsement of iBiquity's IBOC system.

Respectfully submitted,

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